



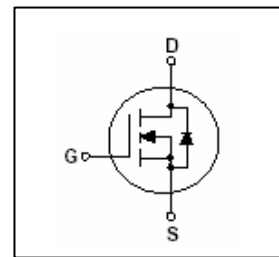
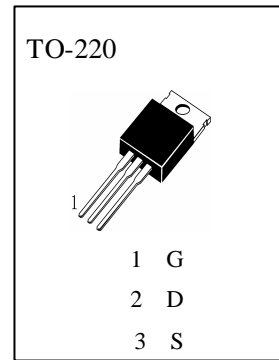
# HFP45N06

## APPLICATIONS

Low Voltage high-Speed Switching.

## ABSOLUTE MAXIMUM RATINGS ( $T_a=25$ )

$T_{stg}$	Storage Temperature.....	-55~175
$T_j$	Operating Junction Temperature .....	150
$P_D$	Allowable Power Dissipation ( $T_c=25$ ) .....	131W
$V_{DSS}$	Drain-Source Voltage .....	60V
$V_{GSS}$	Gate-Source Voltage .....	$\pm 20V$
$I_D$	Drain Current( $T_c=25$ ).....	45A



## ELECTRICAL CHARACTERISTICS ( $T_a=25$ )

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
$BV_{DSS}$	Drain-Source Breakdown Voltage	60			V	$I_D=250 \mu A, V_{GS}=0V$
$I_{DSS}$	Zero Gate Voltage Drain Current			1	$\mu A$	$V_{DS} = 60V, V_{GS}=0$
$I_{GSS}$	Gate -Source Leakage Current			$\pm 100$	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
$V_{GS(th)}$	Gate Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$
$R_{DS(on)}$	*Static Drain-Source On-Resistance			0.028	?	$V_{GS}=10V, I_D = 45A$
$C_{iss}$	Input Capacitance		2050		pF	} $V_{DS} = 25V, V_{GS}=0, f=1MHz$
$C_{oss}$	Output Capacitance		600		pF	
$C_{rss}$	Reverse Transfer Capacitance		200		pF	
$t_{ON}$	Turn-On Time			120	nS	} $V_{DD} = 30V, I_D = 45A$ $R_L=0.667, V_{GS}=10V$ $R_G= 3.6$
$t_{d(on)}$	Turn - On Delay Time		12		nS	
$t_r$	Rise Time		74		nS	
$t_{d(off)}$	Turn - Off Delay Time		37		nS	
$t_f$	Fall Time		16		nS	
$t_{OFF}$	Turn Off Time			80	nS	} $V_{GS}=20V$ } $V_{DS} = 48V, I_D=45A$ $V_{GS}=10V$ } $R_L=1.07$ $V_{GS}=2V$ } $I_g ( REF ) = 1.5mA$
$Q_g$	Total Gate Charge		125	150	nC	
$Q_{g(10)}$	Gate Charge at 10V		67	80	nC	
$Q_{gd}$	Threshold Gate Charge		3.7	4.5	nC	
$V_{SD}$	Diode Forward Voltage			1.5	V	$I_{SD} = 45A$
$R_{th(j-c)}$	Thermal Resistance , Junction-to-Case			1.14	/W	

\*Pulse Test : Pulse Width 300  $\mu s$  , Duty Cycle 2%

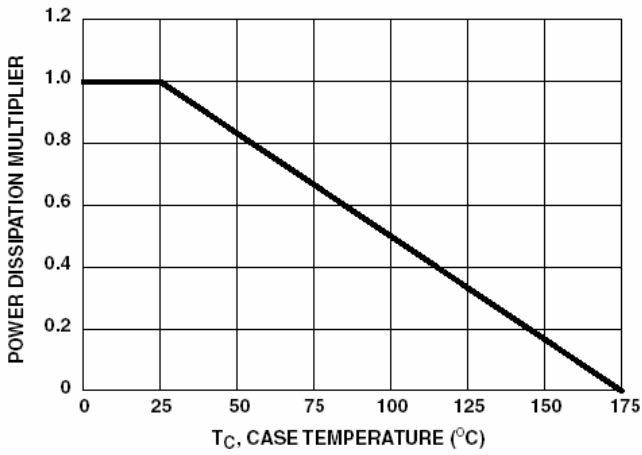


FIGURE 1. NORMALIZED POWER DISSIPATION vs CASE TEMPERATURE

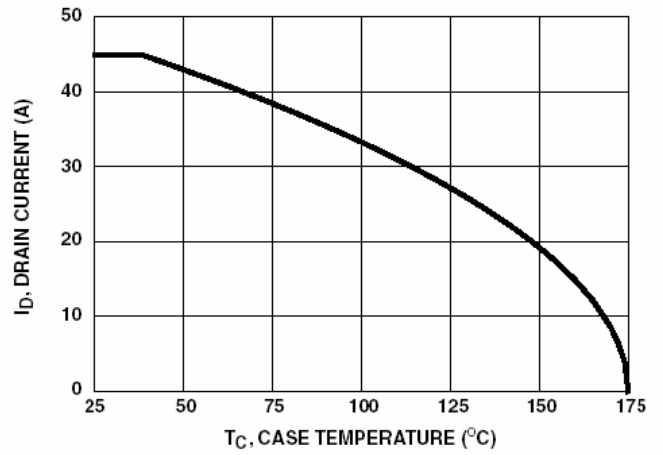


FIGURE 2. MAXIMUM CONTINUOUS DRAIN CURRENT vs CASE TEMPERATURE

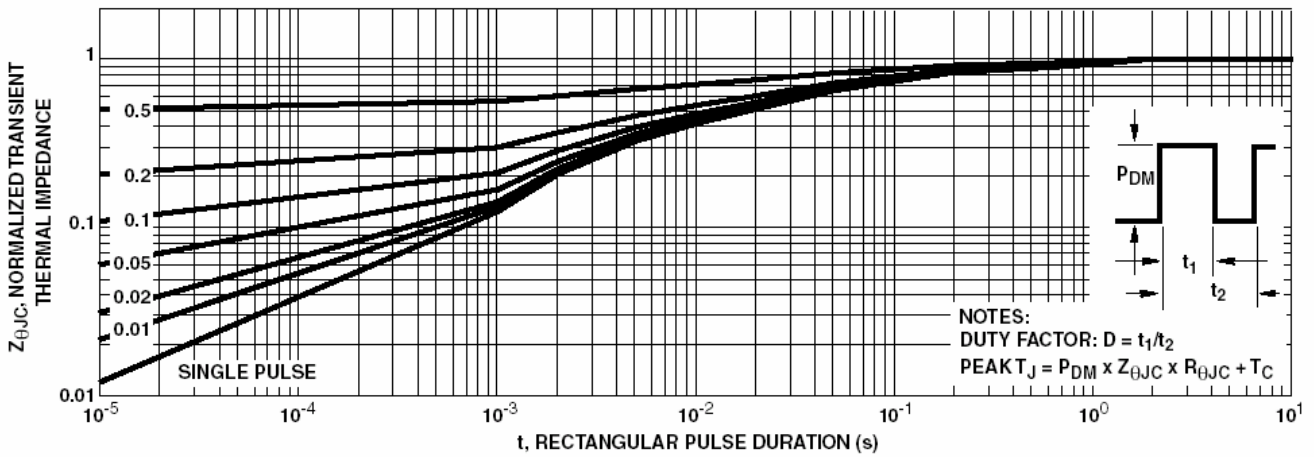


FIGURE 3. NORMALIZED MAXIMUM TRANSIENT THERMAL IMPEDANCE

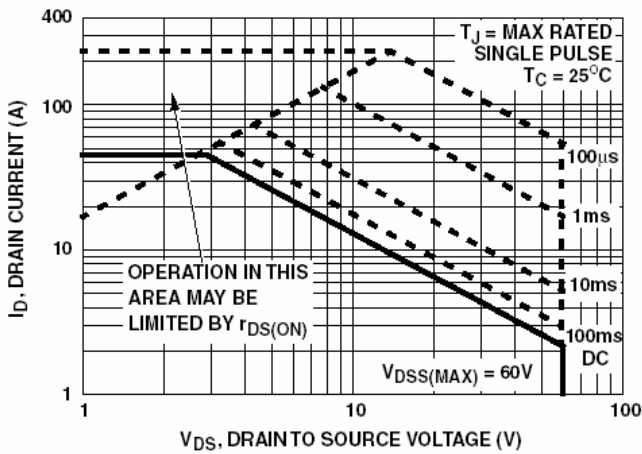


FIGURE 4. FORWARD BIAS SAFE OPERATING AREA

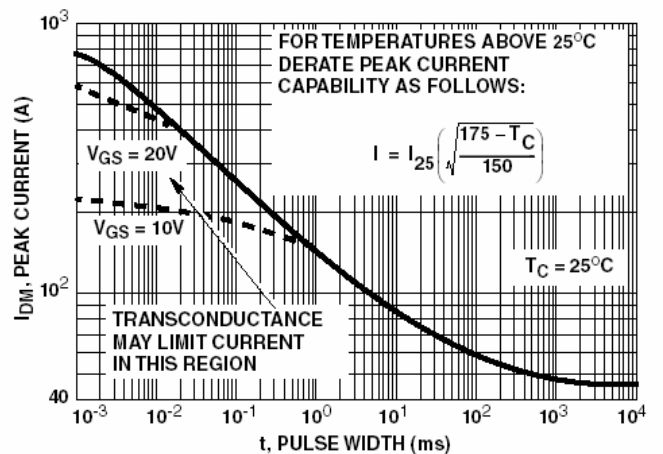


FIGURE 5. PEAK CURRENT CAPABILITY

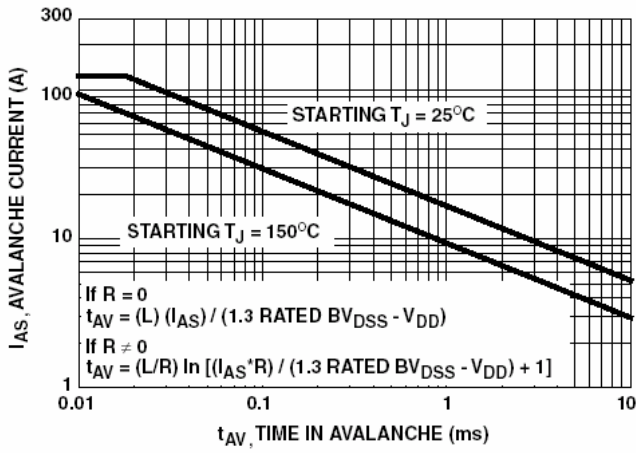


FIGURE 6. UNCLAMPED INDUCTIVE SWITCHING

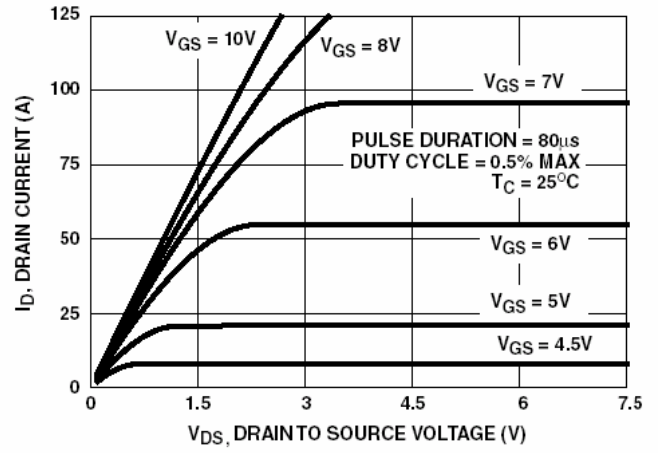


FIGURE 7. SATURATION CHARACTERISTICS

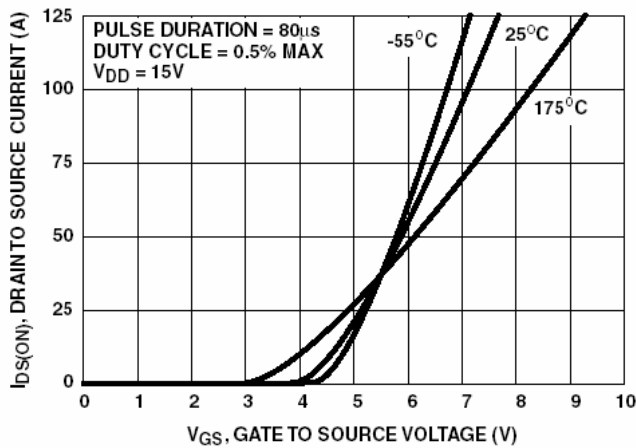


FIGURE 8. TRANSFER CHARACTERISTICS

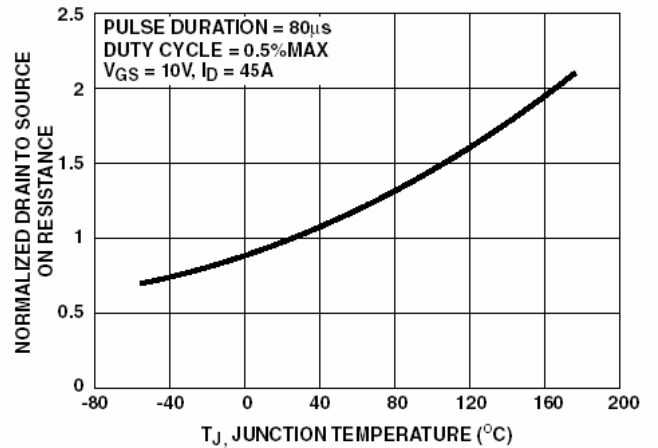


FIGURE 9. NORMALIZED DRAIN TO SOURCE ON RESISTANCE vs JUNCTION TEMPERATURE

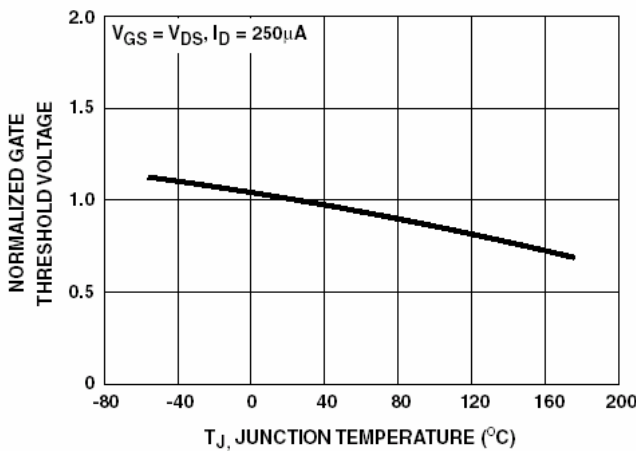


FIGURE 10. NORMALIZED GATE THRESHOLD VOLTAGE vs JUNCTION TEMPERATURE

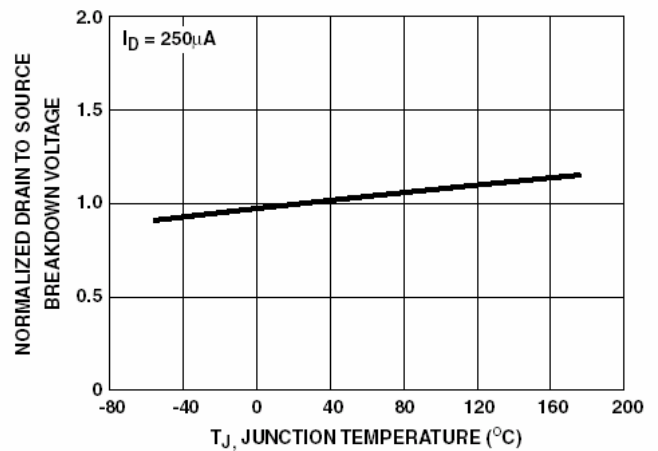


FIGURE 11. NORMALIZED DRAIN TO SOURCE BREAKDOWN VOLTAGE vs JUNCTION TEMPERATURE

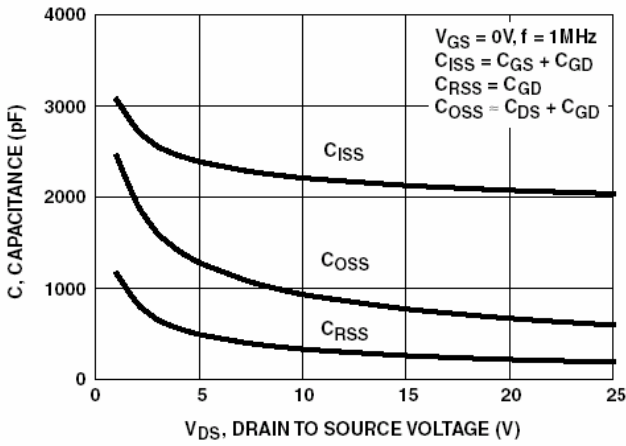


FIGURE 12. CAPACITANCE vs DRAIN TO SOURCE VOLTAGE

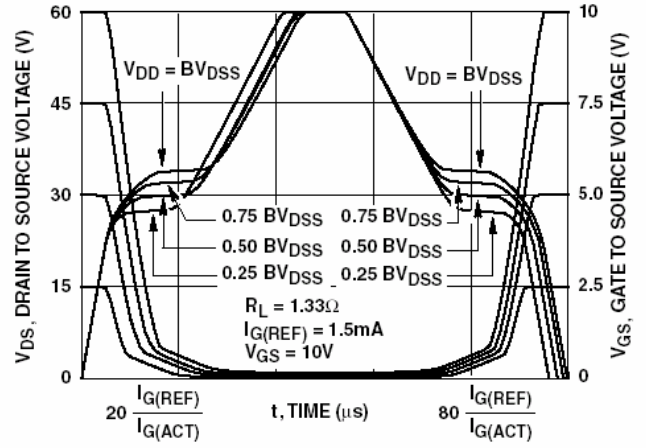


FIGURE 13. NORMALIZED SWITCHING WAVEFORMS FOR CONSTANT GATE CURRENT

**Test Circuits and Waveforms**

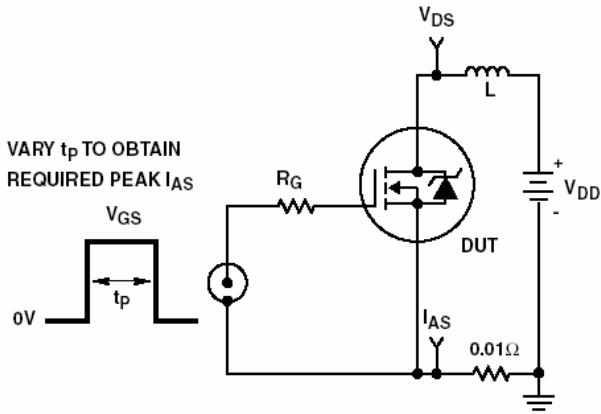


FIGURE 14. UNCLAMPED ENERGY TEST CIRCUIT

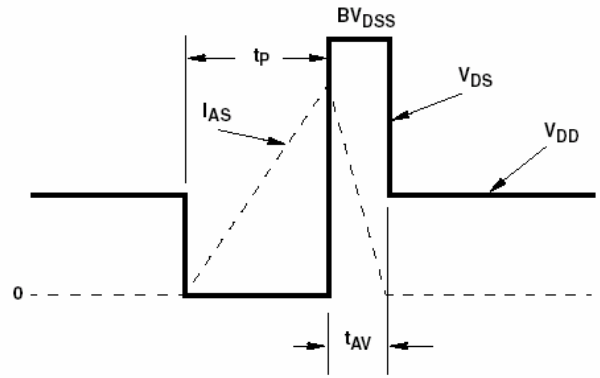


FIGURE 15. UNCLAMPED ENERGY WAVEFORMS

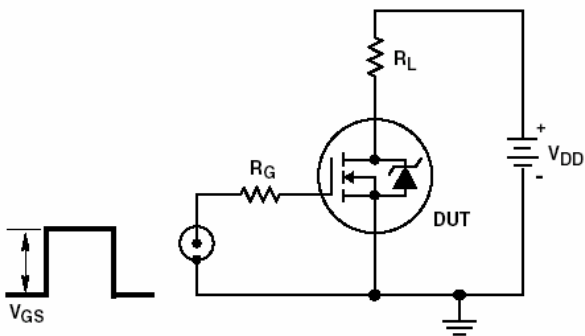


FIGURE 16. SWITCHING TIME TEST CIRCUIT

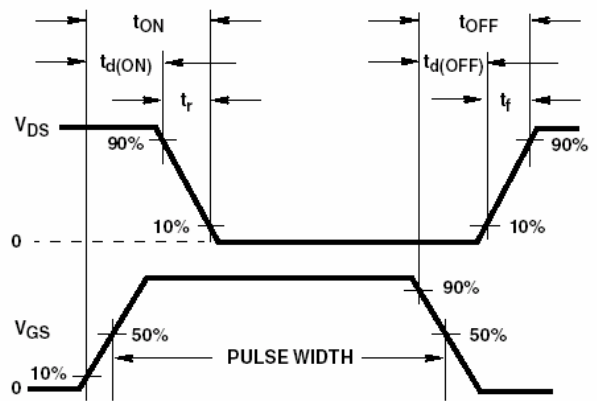


FIGURE 17. RESISTIVE SWITCHING WAVEFORMS

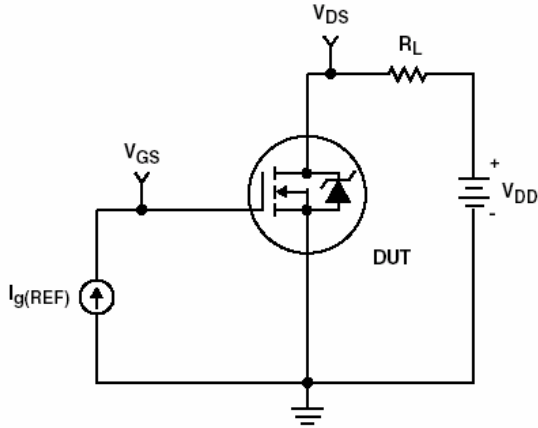


FIGURE 18. GATE CHARGE TEST CIRCUIT

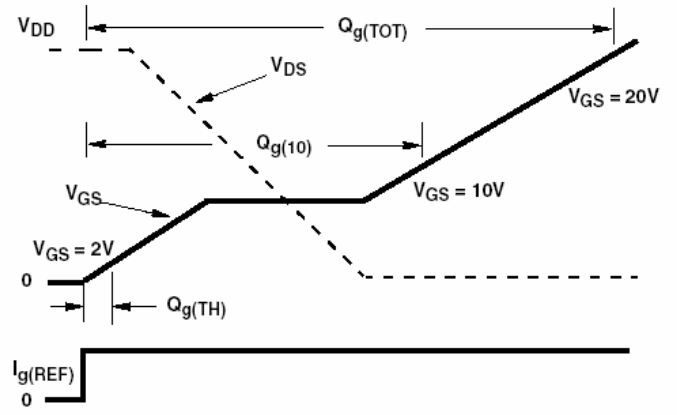


FIGURE 19. GATE CHARGE WAVEFORMS